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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,938	12/31/2001	Yukari Aoki	35.C16091	7016

5514 7590 09/10/2003

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EXAMINER

BERNATZ, KEVIN M

ART UNIT PAPER NUMBER

1773

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,938

Applicant(s)

AOKI, YUKARI

Examiner

Kevin M Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) 5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 4 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☒ Claim(s) 1-5 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other: .

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DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1 - 4, drawn to a magneto-optical medium, classified in class 428, subclass 694MM.
 - II. Claim 5, drawn to a method of using the magneto-optical recording medium using a single laser beam for heating and detection, classified in class 369, subclass 13+.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as claimed can be used in a materially different process of using, such as by heating the medium without using a laser, or by using multiple laser beams, one for heating and one for detection.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mr. Peter Saxon on September 3, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1 - 4. Affirmation of this election must be made by applicant in replying to this Office action. Claim 5 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Applicant further wished the record to note that upon finding of allowable subject matter, rejoinder of claim 5 under MPEP 821.04 would be desired.

Specification

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph within the range of 50 to 150 words, i.e. approximately 15 lines or less (37 CFR 1.72). See MPEP § 608.01(b).

The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

6. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

8. Claims 1, 2 and 4 are rejected under 35 U.S.C. 102(a) as being anticipated by Tamanoi et al. (U.S. Patent No. 6,096,444), as evidenced by applicant's admissions,, Ichihara et al. (U.S. Patent No. 5,187,694) and Kaneko et al. (U.S. Patent No. 5,379,275).

Regarding claims 1 and 2, Tamanoi et al. disclose a magneto-optical recording medium comprising: a first magnetic layer, i.e. applicant's "domain wall displacement layer", (*Table 15 – RE dominant "Second Magnetic Layer"*), a third magnetic layer, i.e. applicant's "recording layer" (*TM dominant "Sixth Magnetic Layer"*), and a second magnetic layer, i.e. applicant's "switching layer") arranged between said domain wall displacement layer and said recording layer (*"Fifth Magnetic Layer"*) and having a Curie temperature lower than those of the latter two layers (*Table 15: 170 °C < 200 °C < 300*

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°C), wherein said domain wall displacement layer, said switching layer and said recording layer are coupled by exchange coupling at temperature not higher than the Curie temperature of said switching layer (*col. 32, lines 7 – 31*).

The limitation(s) “for displacing domain walls” and “for storing information” are (an) intended use limitation(s) and are not further limiting in so far as the structure of the product is concerned. Note that “in apparatus, article, and composition claims, intended use must result in a **structural difference** between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. ***If the prior art structure is capable of performing the intended use, then it meets the claim.***

In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art.” [emphasis added] *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See MPEP § 2111.02.

The limitation “the saturation magnetization of said domain wall displacement layer and that of said recording layer are anti-parallel to each other in a state of being coupled by exchange coupling at temperature close to the Curie temperature of said switching layer” is a functional limitation(s). As defined in the MPEP, “[a] functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971)” – MPEP § 2173.05(g). However, the examiner

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notes that "where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an ***inherent characteristic of the prior art***, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied on" (emphasis added) - MPEP § 2183.

In the instant case, the claimed functional limitation(s) is deemed to be an inherent characteristic of the prior art since the prior art is substantially identical in composition and/or structure. The examiner's sound basis for this assertion is that Tamanoi et al. disclose that the magneto-optical layers are perpendicular magnetization layer with opposite dominant magnetization characteristics (*Figure 44 and Tables 15 and 16, RE vs. TM dominant*) and the Examiner notes that rare earth dominant layers and transition metal dominant layers inherently have saturation magnetization magnitudes opposite in sign from each other, as evidenced by applicant (*Figure 7*), Ichihara et al. (*Figures 2A and 2B and col. 3, lines 46 – 53*) and Kaneko et al. (*Figures 12 and 14; col. 7, lines 63 – 64; and Tables and Examples*). Therefore, since both the domain wall displacement layer and the recording layer are oriented perpendicular to the substrate and the RE rich layer has a negative M_s value and the TM rich layer has a positive M_s value, the saturation magnetization of the two layers are deemed to inherently be in an anti-parallel state to each other, i.e. one pointing upward away from the substrate and the other pointing downward towards the substrate (see *Tamanoi et al., Figure 42 – pictures 5 and 6*).

Regarding claim 4, Tamanoi et al. disclose an embodiment comprising a first magnetic, i.e. "domain wall displacement", layer (*Table 12 – TM rich "First Magnetic Layer"*), a second magnetic, i.e. "switching", layer (*TM rich "Second Magnetic Layer"*) and a third magnetic, i.e. "recording", layer (*RE rich "Third Magnetic Layer"*) meeting applicant's claimed Curie temperature limitations, and deemed to inherently meet applicant's saturation magnetization limitation for the reasons cited above.

Allowable Subject Matter

9. The following is a statement of reasons for the indication of allowable subject matter: while the prior art of record disclose DWDD magneto-optical recording media and magneto-optical recording media meeting applicant's claimed structural limitations, the prior art of record fails to teach or render obvious a magneto-optical recording medium meeting applicant's claimed saturation magnetization limitations, as well as possessing a domain wall displacement layer possessing a compensation temperature between its Curie temperature and the Curie temperature of the switching layer (claim 3).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Matsumoto et al. (U.S. Patent No. 6,128,254) teach a magneto-optical recording medium possessing a similar structure to applicant (*Table 7*), but fails to teach that the magnetization is antiparallel in a state of exchange coupling (*Figure*

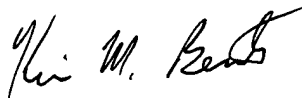
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21B). Takao et al. (U.S. Patent No. 6,455,174 B1) teach domain wall displacement media (*col. 23, lines 1 – 39*), but fails to teach the magnetization directions of the relative layers. Ito (U.S. Patent App. No. 2002/0068194 A1) teach a magneto-optical recording medium comprising magnetic layers, which alternate in RE and TM dominant magnetization (*Figure 3*), but teach that the switching layer is non-magnetic at room temperature and only exhibits magnetization by being in contact with an adjacent magnetic layer (*claim 13*). Since this means that the Curie temperature is below room temperature and Ito is silent about the compensation temperatures of the various layers, the Examiner notes that the disclosed Ito invention fails to meet the limitations of “are coupled by exchange coupling at temperatures not higher than the Curie temperature of the switching layer” and “are anti-parallel to each other ... close to the Curie temperature of the switching layer”.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.



Kevin M. Bernatz
Patent Examiner

September 5, 2003